Community Assistance Program

Floodproofing Study
Hallowell, Maine

July 1990

US Army Corps
of Engineers
New England Division

Sponsored by
Federal Emergency Management Agency - Region 1
Boston, Massachusetts

COMMUNITY ASSISTANCE PROGRAM

FLOOD PLAIN MANAGEMENT ASSISTANCE

CITY OF HALLOWELL, MAINE

July, 1990

By:

U.S. Army Corps of Engineers
New England Division
Waltham, MA

Funded by: Federal Agency Support
Services Element of the Community
Assistance Program

EXECUTIVE SUMMARY

This report documents the results of an investigation to support comprehensive flood plain management planning for the City of Hallowell, Maine. The report presents flood proofing concepts for non-residential buildings located in both a business and historic district.

The City of Hallowell is a participant of the National Flood Insurance Program. This program requires that all new construction and substantial improvements of non-residential structures be elevated or dry flood proofed to the base flood elevation. The City is experiencing pressure to renovate buildings located in the downtown business district which is vulnerable to flood damages. Mindful of sustaining its economic vitality, the City is concerned that meeting these requirements would discourage business growth.

Alternative flood proofing designs have been formulated and evaluated for three typical non-residential buildings located in the business and historic district. Representative buildings were selected with the assistance of the City Manager. Construction costs and visual changes to the building are described in this report. The designs are based on meeting the dry flood proofing criteria of the National Flood Insurance Program and guidelines included in the Secretary of Interior's <u>Standards for Historic Preservation Projects</u>.

Evaluation of the alternative designs reveal that construction costs and visual changes vary depending upon the type of building and method of protection. Construction costs for non-residential masonry buildings subject to water levels less than six feet vary from \$ 9,000 to \$ 17,000. Flood proofing designs for this type of building appear to be capable of minimizing visual changes to the building. Construction costs for elevating multiple-storied wood framed buildings are estimated to be \$ 37,000. Elevation techniques may significantly alter the visual appearance and not conform to the City's Historic and Zoning Ordinances. The use of flood walls or other flood proofing techniques, although more costly, may be a preferred alternative.

Several of the buildings in the historic district may qualify for a variance from standard flood proofing requirements. Variances allow participation in the National Flood Insurance Program but insurance premium rates are determined by statute according to existing risk and are not modified by the granting of variances. Buildings that contribute to the historical significance of the historic district would be eligible for the National Register and would therefore be eligible for variances status by the Federal Emergency Management Agency. A preliminary determination of such buildings would need to be made by the State Historic Preservation Commission or by the Secretary of the Interior. Buildings that qualify for a variance may be allowed to implement alternative methods such as wet or emergency flood proofing measures in interests of preserving the historical significance of the district. Upon request, the State Historic Preservation Office would provide the City with a list of the contributing and noncontributing structures and elements within the historic district.

This report has been developed as part of the work effort under the Federal Agency Support Services Element of the Community Assistance Program (CAP-FASSE) between the Federal Emergency Management Agency and the US Army Corps of Engineers, New England Division.

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SECTION I - INTRODUCTION

BACKGROUND

The City of Hallowell, Maine, is a participant in the National Flood Insurance Program which is administered by the Federal Emergency Management Agency (FEMA). The City has experienced flood damages from the Kennebec River on several occasions. The most significant flood damages have occurred within the business district adjacent to the river. A large portion of the business district includes a historic district that is listed on the National Register of Historic Places. Concerned with the need to maintain its economic vitality and to preserve its historic and architectural character, the City has requested community assistance for floodplain management planning. The City has expressed concern that the implementation of floodproofing requirements consistent with preserving its unique historic character would discourage economic growth within the City.

In response to this request, FEMA has contracted with the US Army Corps of Engineers, New England Division, (Corps) a study effort to examine and evaluate flood proofing techniques as they would apply to the City. Results of the study conducted by the Corps are presented in this report.

PURPOSE AND SCOPE

The purpose of this study is to investigate flood proofing techniques for existing non-residential buildings and potential new construction located within the business and historic district. Flood proofing techniques are designed to meet the dry flood proofing criteria of the National Flood Insurance Program (NFIP), and maintain compatibility with the structures' historic character.

The scope of work consists of evaluating various flood proofing alternatives for three different buildings representative of the types of buildings found in the business and historic district. The report describes alternative flood proofing designs, visual changes to the building and construction cost estimates. While similar flood proofing concepts can be applied to new construction, cost estimates may not be representative. An evaluation of the economic relationships between cost of alternatives and benefits of flood damage reduction is beyond the scope of this study.

The study effort includes review of publications and regulations, an on-site reconnaissance survey and a presentation of results. A listing of several technical and regulatory publications are presented in the Bibliography. An on-site reconnaissance survey was conducted to meet with local merchants and officials, select buildings for further study and collect data on the typical buildings. The presentation of results includes conducting meetings with the City to describe findings and preparation of this report.

SECTION II - EXISTING CONDITIONS

GENERAL SETTING

The City of Hallowell, Maine, is located on the west bank of the Kennebec River and immediately south of Augusta, the State Capitol. A general location map is shown in Plate 1.

The business district and its proximity to the Kennebec River is shown in Plate 2. Two principal thoroughfares, Water Street and Second Street, parallel the river. The highest density of buildings is located on each side of Water Street. Front Street, which lies between the Kennebec River and Water Street, is used to gain access to the rear of buildings of Water Street as well as to the riverfront setting.

HISTORICAL RESOURCES

The City of Hallowell has a historic district listed on the National Register of Historic Places. The historic district is comprised of 450 buildings of public, private, commercial and industrial use and is shown in Plate 3. The district retains the architectural integrity of Hallowell as it was when the town was a prosperous nineteenth century river port.

Information concerning the prehistoric and historic periods within the Hallowell setting is provided in the Kennebec River Basin, Water Resources Study, March, 1989, by the US Army Corps of Engineers. The information includes a description of the economic growth and development in Hallowell from the time of early European settlements.

FLOODING

Flood insurance rate maps identify the 100-year flood elevation (i.e. a flood event having a 1% chance of occurrence for a given year) as 32 feet National Geodetic Vertical Datum (NGVD) in Hallowell. Water levels from the 100-year flood event is shown in Plate 4. The 100-year flood elevation is synonymous to the base flood elevation (BFE). Approximately seventy buildings are subject to flooding from the BFE. More than one-half of these buildings experience water levels greater than 6 feet during the BFE. A summary of these buildings by classification, construction material and count is shown in Table 1. The majority of these buildings are within the business and historic district.

The most significant flooding within the Kennebec River Basin occurs during the winter and spring seasons as a result of rainfall, snowmelt or combination of both. Concrete engravings on the southwest corner of 136 Water Street have recorded a recent history of peak flood levels. A photograph of these engravings is shown in Plate 5.

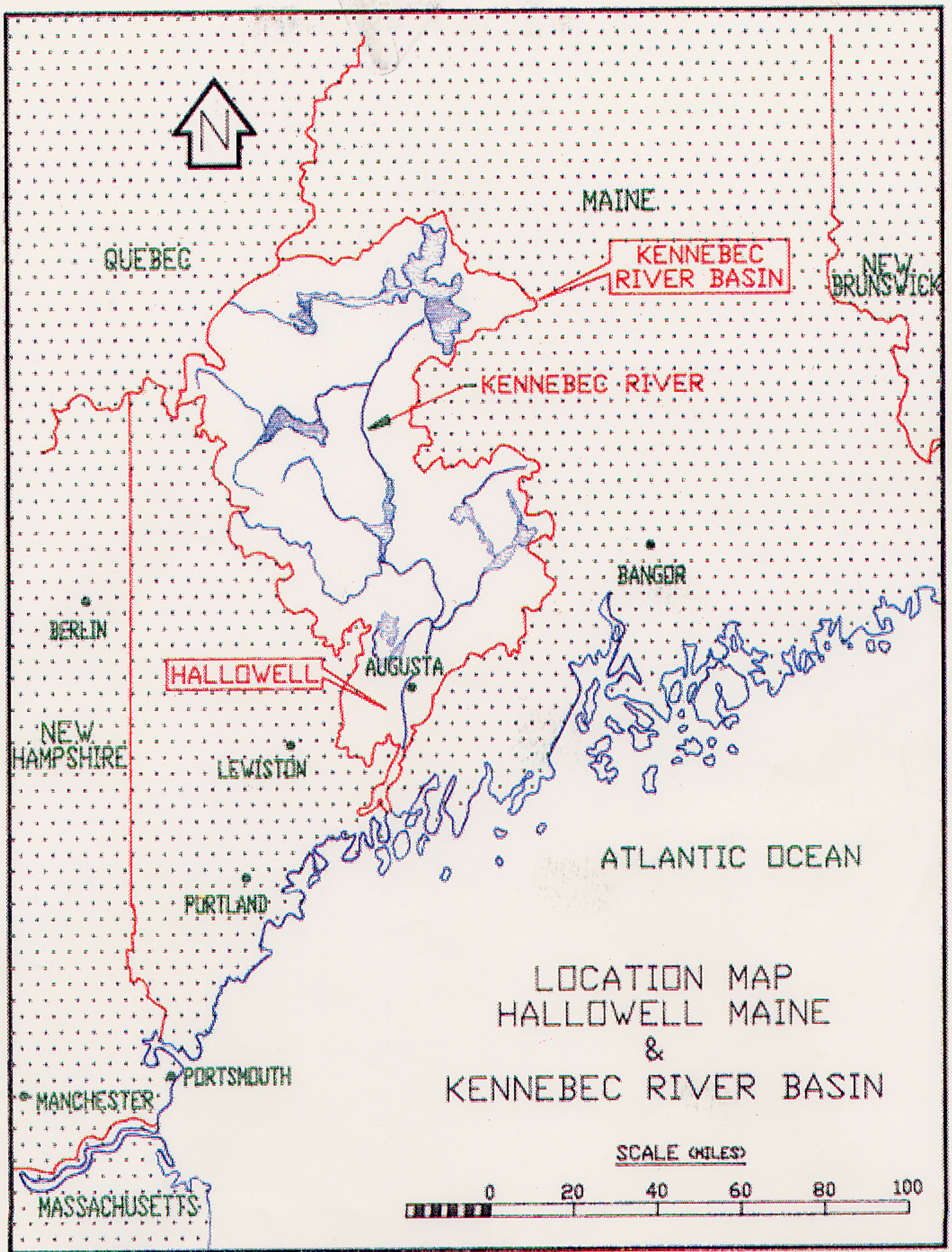

N
MAINE
QUEBEC
KENNEBEC RIVER BASIN
NEW BRUNSWICK
KENNEBEC RIVER
BANGOR
BERLIN
HALLOWELL
AUGUSTA
NEW HAMPSHIRE
LEWISTON
ATLANTIC OCEAN
PORTLAND
LOCATION MAP
HALLOWELL MAINE
&
KENNEBEC RIVER BASIN
PORTSMOUTH
MANCHESTER
SCALE (MILES)
0
20
40
60
80
100
MASSACHUSETTS

PLATE 1

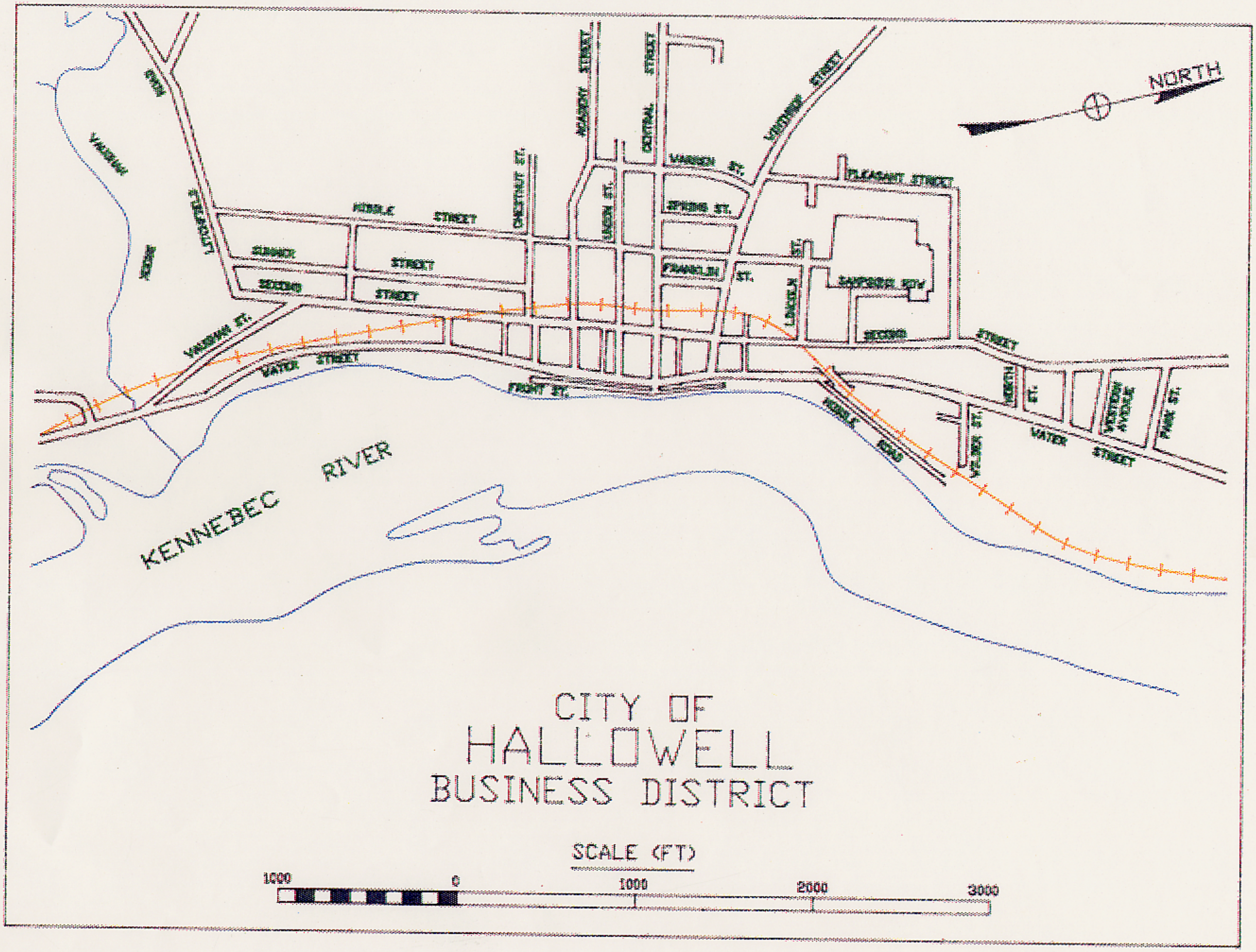

NORTH
KENNEBEC RIVER
VAUGHN ST.
WATER STREET
FRONT ST.
SECOND STREET
ACADEMY STREET
CENTRAL STREET
CHESTNUT ST.
UNION ST.
SPRING ST.
FRANKLIN ST.
PLEASANT STREET
LINCOLN ST.
NORTH ST.
PARK ST.
CITY OF
HALLOWELL
BUSINESS DISTRICT
SCALE (FT)
1000
0
1000
2000
3000

PLATE 2

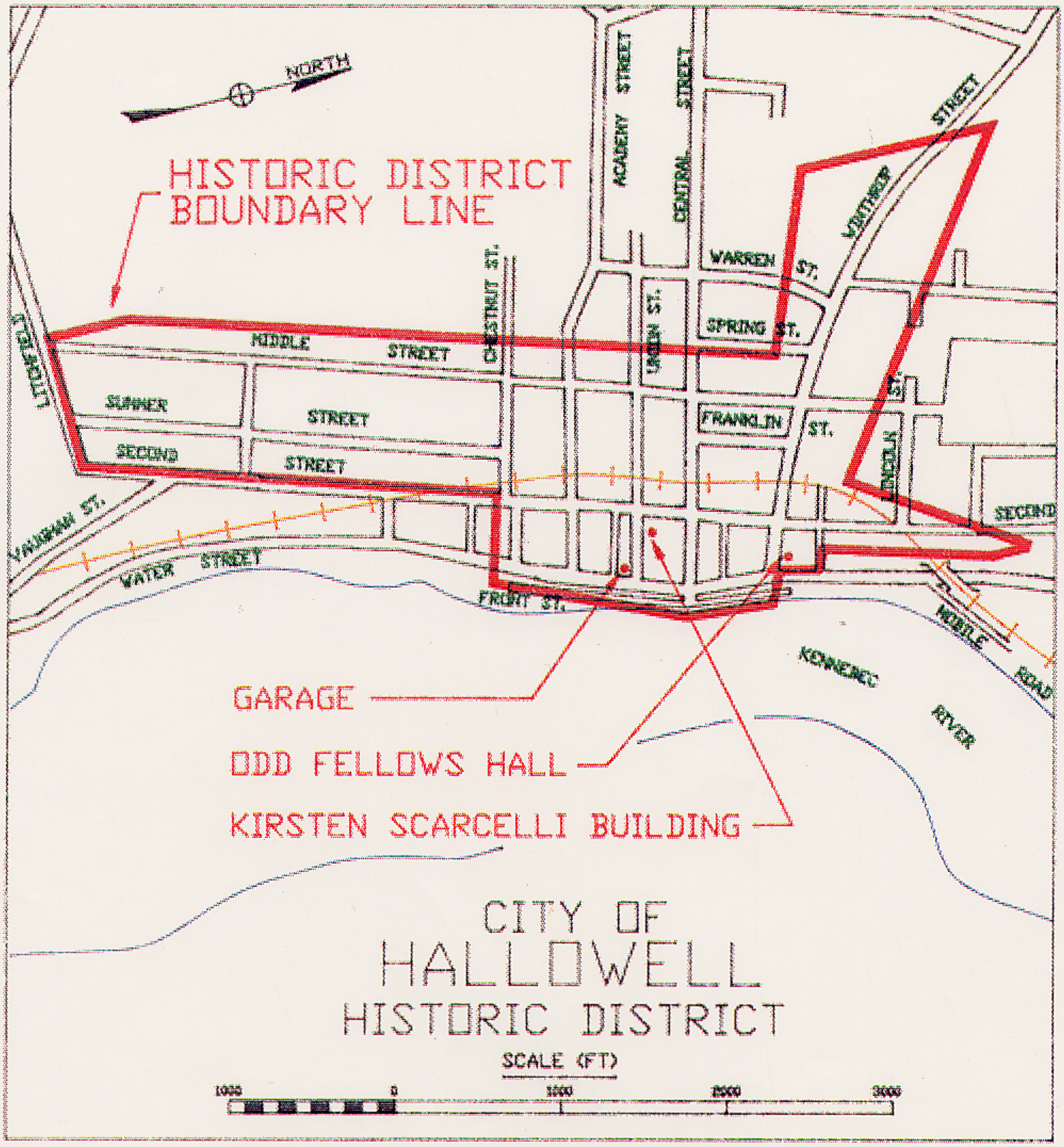

NORTH
HISTORIC DISTRICT BOUNDARY LINE
ACADEMY STREET
CENTRAL STREET
WINTHROP STREET
WARREN ST.
SPRING ST.
CHESTNUT ST.
UNION ST.
MIDDLE STREET
LITCHFIELD
SUMNER STREET
SECOND STREET
FRANKLIN ST.
LINCOLN ST.
SECOND
VAUGHAN ST.
WATER STREET
FRONT ST.
MOBILE ROAD
KENNEBEC RIVER
GARAGE
ODD FELLOWS HALL
KIRSTEN SCARCELLI BUILDING
CITY OF HALLOWELL HISTORIC DISTRICT
SCALE (FT)
1000
0
1000
2000
3000

PLATE 3

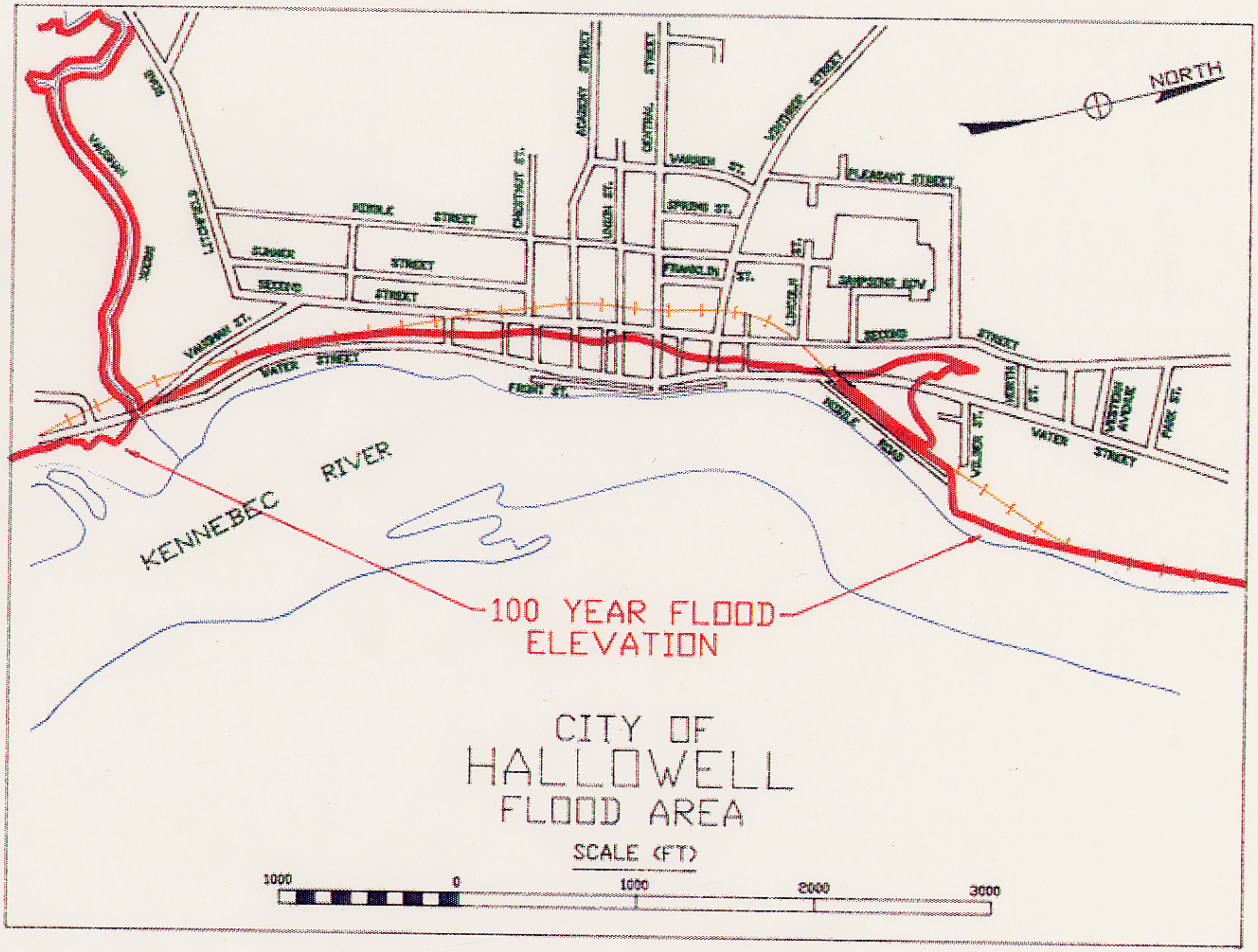
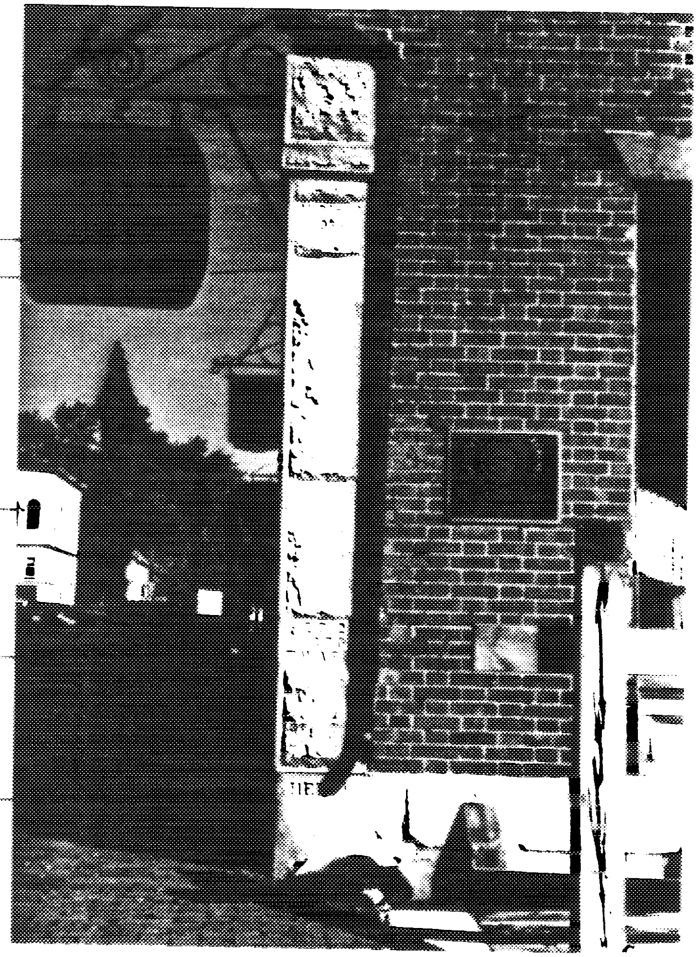

NORTH
KENNEBEC RIVER
100 YEAR FLOOD ELEVATION
CITY OF HALLOWELL FLOOD AREA
SCALE (FT)
1000
0
1000
2000
3000
MIDDLE STREET
SUMMER STREET
SECOND STREET
WATER STREET
FRONT ST.
VAUGHAN ST.
ACADEMY STREET
CENTRAL STREET
WINTHROP STREET
PLEASANT STREET
SPRING ST.
FRANKLIN ST.
UNION ST.
CHESTNUT ST.
LINCOLN ST.
SECOND STREET
WATER STREET
PARK ST.

PLATE 4

March 13, 1936 EL = 30'
April 1, 1987 EL = 29'
March 2, 1896 EL = 26'
February 2, 1870 EL = 24'
March 26, 1826 EL = 22'



FLOOD LEVELS AT 136 WATER STREET
HALLOWELL, MAINE

PLATE 5

The flood event of March 1936 produced the highest flood water levels in the lower main stem of the Kennebec River. River levels reached an elevation of about 30 feet NGVD in the business and historic district. This flood event did not produce the highest recorded flow but the high flood levels occurred due to the effect of ice jams. The March/April 1987 flood event produced the highest flood flows and was the result of intense rainfall and snowmelt. Peak flows on the lower main stem of the Kennebec River ranged from 20 to 30 percent greater than the previous record flood event of March 1936. While flow rates were higher in 1987, record river levels were not as severe due to the absence of ice jamming. River levels reached an elevation of about 29 feet NGVD.

TABLE 1

A SUMMARY OF BUILDINGS SUBJECT TO BFE

Classification	Construction Material	No. of Buildings
Residential (less than 2 stories)	Wood	9
Residential (more than 2 stories)	Wood	10
Residential	Masonry	1
Commercial	Masonry	28
Commercial	Wood	20
Municipal	Masonry	2

LOCAL ORDINANCES

In order to be a participant of NFIP, regulations, in part, require that the community adopt floodplain management regulations consistent with Federal criteria. To meet this requirement, the City of Hallowell has established a "Floodplain Management Ordinance". This Ordinance establishes a Flood Hazard Development Permit system and review procedure for development activities in the flood hazard areas of the community. The flood hazard area is defined to be equivalent to the BFE. This ordinance contains standards for new construction and substantial improvements of any structure located in the designated flood hazard area and requires that the structure be protected to at least one foot above the BFE.

Appeals and variances are addressed in Article IX of the Floodplain Management Ordinance and Section 60.6 of NFIP. The Board of Appeals of the City may decide appeals and grant a variance from the requirements of the Ordinance consistent with the criteria contained in Article IX. The issuance of variance is for floodplain management purposes only and insurance premium rates are determined by statute according to actuarial risk and is not modified by the granting of a variance (NFIP Section 60.6).

Paragraph E of Article IX includes a variance article that, in part, "may be issued by a community for the reconstruction, rehabilitation or restoration of structures listed on the National Register of Historic Places or a State Inventory of Historic Places". It is important to note that FEMA interprets this variance to include structures which are considered to contribute to the historical significance of a registered historic district as determined by the State Historic Preservation Commission or by the Secretary of the Interior. Upon request, the State Historic Preservation Office would provide the town with a list of the contributing and noncontributing structures and elements within the historic district. Contributing structures would be considered eligible for the National Register and would therefore be eligible for a variance.

The Federal Insurance Administrator may review a community's findings justifying the granting of variances. Should that review indicate a pattern inconsistent with the objectives of sound flood plain management, the Administration may take appropriate action. This action may include probation and possible suspension of community eligability for the sale of flood insurance.

The City has established a "Historical Preservation Ordinance". This Ordinance requires that rehabilitation and construction projects within the historic district be compatible with the character of the district.

> "The City of Hallowell is faced with the threat of losing a quality which makes it unique - its historic and architectural character. The loss of such character or the erosion of the cityscape in certain distinctive areas of the city through demolition, alteration, addition, relocation, incompatible new construction or any other activity which would result in a significant exterior change contributes to the destruction of Hallowell's unique character which is important to the well-being of the community."
> <u>Hallowell Historic Preservation Ordinance</u>, Section 24-13 Part 1.

Another significant Ordinance established in Hallowell is the "Zoning Ordinance of the City of Hallowell, Maine". This Ordinance governs "all land and all structures within the boundaries of the City of Hallowell in concert with....other Ordinances of the City of Hallowell". This ordinance includes definition of districts and land use maps, performance standards and other criteria. The criteria of this Ordinance applies to the Flood Hazard area, business district, historic district as well as to all other lands in the City limits.

SECTION III- COMMUNITY SURVEY

RECONNAISSANCE

A field survey was conducted in Hallowell to select buildings for further study. Three alternative flood proofing options would then be evaluated for each building to formulate general conclusions of flood proofing design and costs.

Buildings were initially screened to determine viability for examining alternative flood proofing options. Building selection was limited to non-residential structures that would experience water levels of six feet or less during the BFE. Non-residential structures were considered due to the business interests specified by the City. Water levels of six feet or less were chosen based as the upper limit of masonry walls to withstand lateral hydrostatic forces as suggested in the literature. Generally, those buildings east of Water Street were excluded from further consideration since water levels exceed six feet at the walls.

SELECTION

Three buildings were selected to represent typical different buildings located in the flood hazard area of the business and historic district. Typical buildings were of the non-residential category; different buildings were of distinct materials such as brick, wood and concrete block and also varied in the design character. The selection process incorporated discussions with local and state agencies and interviews with owners or local merchants. The selection process was closely coordinated with and agreed upon by the City manager. The three buildings chosen for further study were 1) Odd Fellows Hall, 2) Kirsten Scarcelli Building and 3) a Garage located at 161 Water Street.

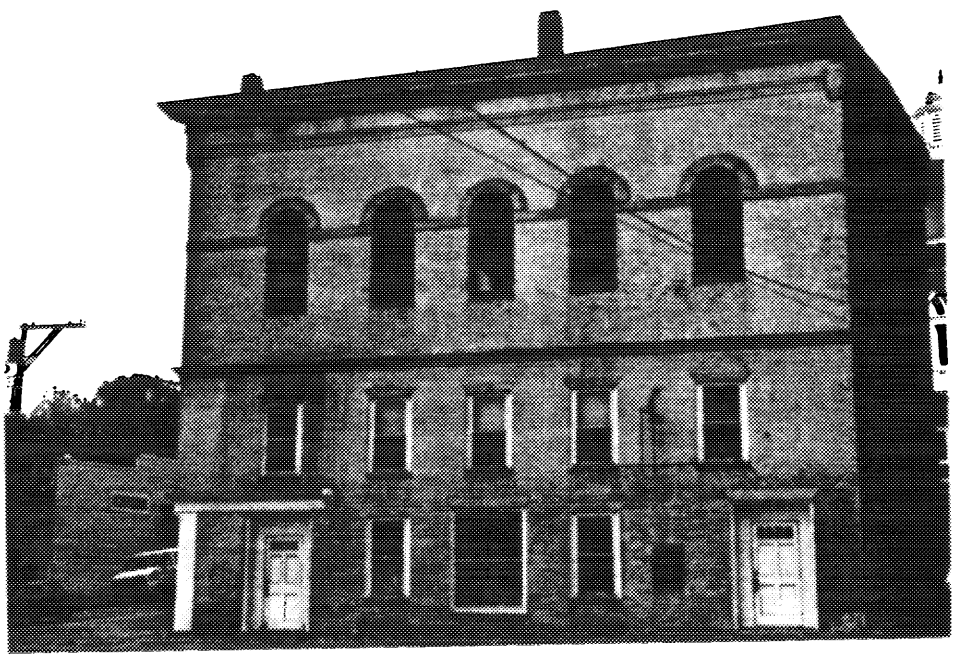
Odd Fellows Hall

Odd Fellows Hall is located at the northwest corner of the intersection between Water Street and Winthrop Street as shown in Plate 3. The building is constructed of brick and granite. Photographs of the building are shown in Plates 6, 7, 8 and 9. The south and east facade of the building is shown in Plate 6; the east facade is shown in Plate 7; the east and north facade in Plate 8; and, the north and west facade is shown in Plate 9. There are no openings, windows or doors on the north facade of the building. Normal access to the building is gained from the two doors located on the east side.

Historically, use of this building has included a fire engine house and a bank. Evidence of historical use is still visible in the first floor. The ceiling of the first floor is high and ceiling joists have been arched to accommodate horse-drawn fire engines. A large obsolete bank vault is located on the northwest corner of the first floor. Currently, the building is not in active use and is in the process of interior renovation by the owner. The building is a non-residential structure.

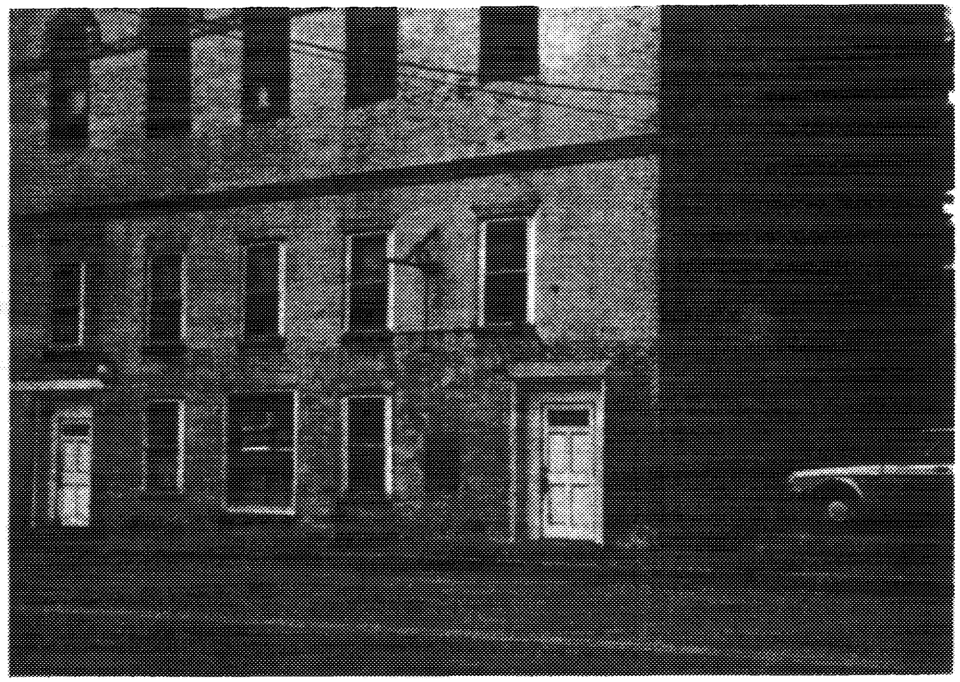
ODD FELLOWS HALL
SOUTH & EAST FACADES

PLATE 6



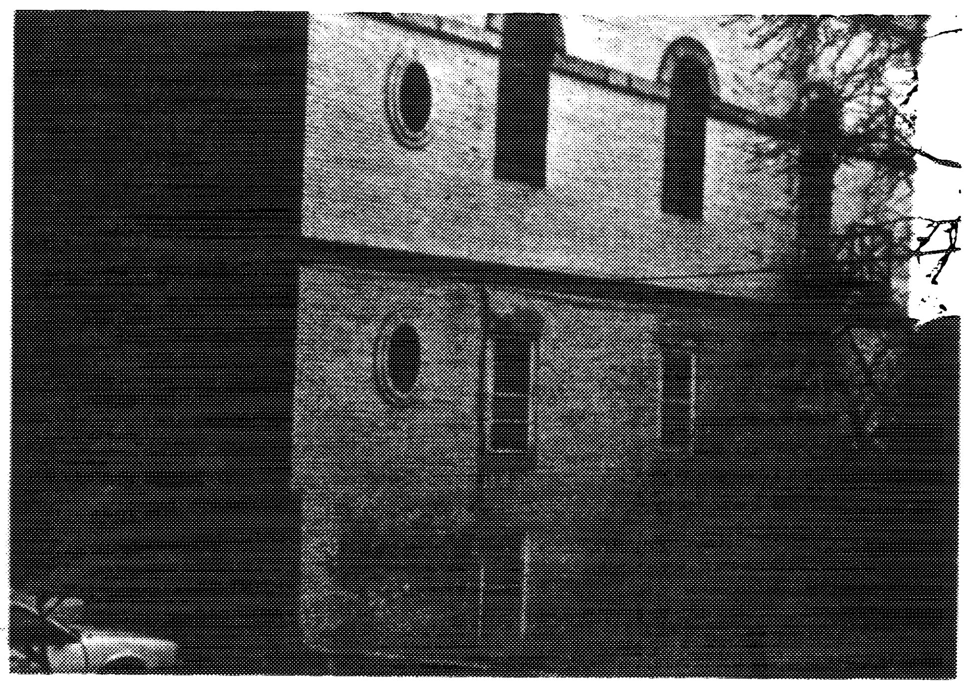
ODD FELLOWS HALL
EAST FACADE

PLATE 7



ODD FELLOWS HALL
EAST & NORTH FACADES

PLATE 8



ODD FELLOWS HALL
NORTH & WEST FACADES

PLATE 9

The external dimensions of the building are approximately 30 feet by 52 feet and is three stories in height. The external low corner elevation and the first floor is 30 feet NGVD. The two access doors on the east facade have sills at grade (30 feet NGVD). The two smaller windows on the east facade and the three windows on the west facade have sills at elevation 32 feet NGVD. The larger window on the east facade has a sill at elevation 31.5 feet NGVD. The large bay windows, supported by wood framing, have sill elevations at 31.5 feet NGVD. The bay windows are later additions to the structure and were once used as egress for horse-drawn fire engines. A granite curbing lies beneath the wood framing at grade.

A basement approximately 6 feet high is beneath the first floor. Entrance to the basement is limited to internal access. There are no external doors, bulkheads or windows at basement level, however close inspection of the exterior indicates that windows were once included in the basement level. This evidence can be observed beneath the windows of east facade where cut granite blocks indicate upper sills. The basement walls are constructed of granite blocks, brick and later additions of concrete. The basement floor is concrete. Several penetrations through the basement wall have been made to accommodate service lines and utilities. This includes water and sanitary pipes, and oil feed and ventilation lines. Equipment in the basement includes an old furnace and 275 gallon oil drums.

Discussion with the owner revealed that flood damage occurred to the basement during the flood of March/April 1987. Water levels were said to be just beneath first floor elevation and that slight to moderate amounts of seepage occurred through basement walls from subsurface infiltration. However, significant problems developed when the subsurface soil entered via the penetrations and partly filled the basement with soil. This was particularly the case along the south wall of the basement where the water and sanitary lines enter the building. Seepage up through the basement floor was not indicated.

Kirsten Scarcelli Building

The Kirsten Scarcelli Building is located at 9 Union Street as shown in Plate 3. The building is constructed of wood framing. Photographs of the building are shown in Plates 10, 11, 12 and 13. The south facade, which faces Union Street is shown in Plate 10; the east facade is shown in Plate 11; the north and west facades are shown in Plate 12; and, the south and west facades are shown in Plate 13. There are no openings, windows or doors on the west facade. Access to the building is gained from doorways located on the south, east and north sides.

The original structure appears to have been constructed in 1892, however the building has undergone recent renovation. Currently, a commercial fabric shop and a professional service center occupy the building.

KIRSTEN SCARCELLI BUILDING
SOUTH FACADE

PLATE 10

KIRSTEN SCARCELLI BUILDING
EAST FACADE

PLATE 11

KIRSTEN SCARCELLI BUILDING
NORTH & WEST FACADES

PLATE 12

KIRSTEN SCARCELLI BUILDING
SOUTH & WEST FACADES

PLATE 13

The external dimensions of the building are approximately 36 feet by 57 feet and is three stories in height. The elevation of the external low corner is about 27 feet NGVD, and the first floor elevation is about 29 feet, NGVD. On the south facade, the elevation of the sills of the two smaller doors are 29.5 feet NGVD, the elevation of the sill to the larger double doors is about 30 feet NGVD and the elevation of the window sill is 31 feet NGVD. On the east and north facades, the elevation of the door sills is 29.5 feet NGVD, and the elevation of the window sills is 31 feet NGVD.

A basement approximately 6 feet in height is beneath the first floor. Entrance to the basement is gained from an external bulkhead located on the east side of the building. There are two small window openings immediately below grade in the basement foundation. The basement walls are constructed of granite blocks and later additions of concrete. The basement floor consists of graded earthfill. The basement ceiling is insulated. Other than a 6 inch PVC sanitary line and a telephone switch box, there are no utilities or equipment in the basement.

Discussion with the owner revealed that some flood damage occurred from the flood of March/April of 1987. Water entered the basement and rose to a level just beneath the first floor. The insulation got wet, however, the water level did not rise to the first floor elevation.

Garage

This building is located at 161 Water Street as shown in Plate 3. The building is constructed of concrete block atop slab-on-grade. Photographs of the building are shown in Plates 14, 15, 16 and 17. The east and north facades are shown in Plate 14; the east facade in Plate 15; the west facade in Plate 16; and, the south facade in Plate 17. Two openings may be used to gain access to the main structure; a bay door on the east facade, and a doorway on the north east corner of the structure. Another doorway exists at the northwest side of the building and is believed to be a lavatory entrance.

The structure appears to have been constructed during this century as a gas station and repair service center. Currently, the building and lot are used to store materials and is not in active commercial use.

The external dimensions of the one-story building are approximately 23 feet by 27 feet. The elevation of the low corner and first floor is 26.5 feet NGVD. The sill elevation of the three doors is 26.5 feet NGVD, the sill elevation of the bay windows adjacent to the northeast door is 28.5 feet NGVD and the sill elevation of the three windows on the south side of the structure is 29.5 feet NGVD. The sill elevation of the three windows on the west side of the building are 30.0 feet, 29.5 feet and 29.5 feet NGVD.

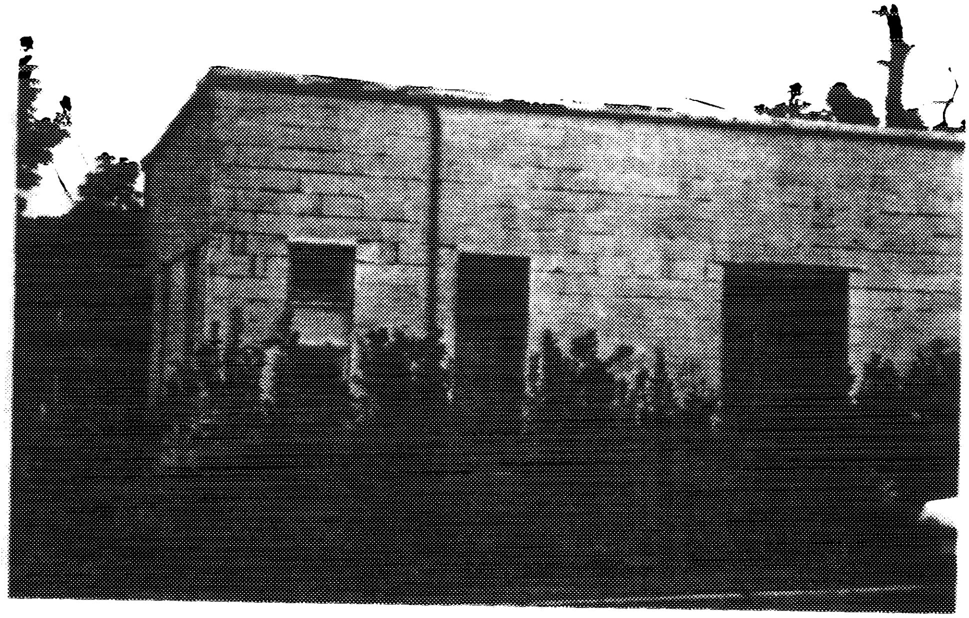
During the flood of March/April 1987 water levels rose about 3 feet above grade. No evidence of structural damage was observed. Losses from the flood would have occurred to materials that were stored below the flood level.

GARAGE
EAST & NORTH FACADE

PLATE 14

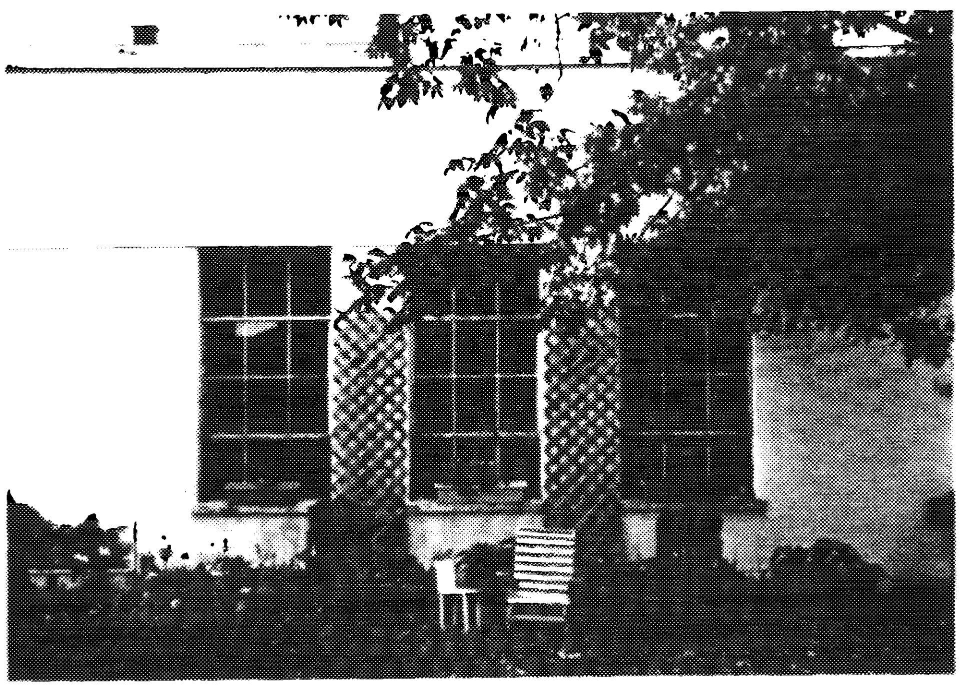
GARAGE
EAST FACADE

PLATE 15



GARAGE
WEST FACADE

PLATE 16



GARAGE
SOUTH FACADE

PLATE 17

SECTION IV - FORMULATION AND EVALUATION

FORMULATION

Federal, State, Regional and Local agencies were be contacted to identify sources of technical assistance and to develop an understanding of floodplain and other regulations. These agencies provided insight to flood proofing applications, preferred techniques and specific design components. Federal and State Historic Preservation Agencies were contacted since a large portion of the study area is a historic district listed on the National Register of Historic Places.

Hydrologic information was obtained from the Flood Insurance Study for the City of Hallowell, Maine, completed in May 1979. This information included delineation of the floodplain boundaries and flood characteristics within the community. Physiographic information delineating the extent of flooding in Hallowell was obtained from the Kennebec River Basin Water Resources Study of March, 1989. Flood proofing design concepts were obtained from several publications which are listed in the Bibliography. Local, State and Federal regulations were reviewed to determine requirements associated with flood proofing.

Flood Proofing

The term "flood proofing" as it is used throughout this text requires clear definition since it can lead to misinterpretation. FEMA defines flood proofing as "any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage to real estate or improved real property, water and sanitary facilities, structures and their contents". In this report, the term "flood proofing" applies to the design or modification to a building that provides protection from flood waters up to the BFE.

Examples of flood proofing include elevating buildings, placing walls or levees around buildings, providing water tight closures for doors and windows, using paints, membranes and sealants to reduce seepage into structures and relocating utilities above expected flood levels. Flood proofing techniques are classified as permanent, contingent and emergency measures. Although these classification are not always clearly defined, sufficient distinction exists to exemplify flood proofing techniques into these types of measures. Permanent measures are those which, once installed, require no further action to be taken when flooding occurs. Contingent measures require some type of installation, activation or other preparatory response prior to the occurrence of a flood. Emergency measures are able to be initiated on relatively short notice using stored materials but do not satisfy the minimum requirements for watertight flood proofing as set forth by the NFIP. Several publications describing the application of flood proofing measures are readily available. A few of these publications are included in the Bibliography.

The buildings selected for further study in Hallowell are non-residential buildings. Floodplain regulations and ordinances allow non-residential structures to be flood proofed using two methods. One method is to elevate the structure so that the lowest floor including the basement is at least one foot above the BFE. The other method is to flood proof at least one foot above the BFE so that below that elevation the structure is watertight with walls substantially impermeable to the passage of water.

Historic Preservation

Several standards for projects involving historic structures and districts have been developed by the Secretary of the Interior's Standards for Historic Preservation Projects. These standards are provided to guide planners, administrators and project proponents during design and execution of projects involving historic preservation interests. General standards and definitions, which are applicable to flood proofing endeavors, are listed in Appendix A. A list of Federal Historic Agencies are provide in Appendix B. Complete standards and appropriate guidelines are available from the National Park Service and the Maine Historic Preservation Commission.

Flood proofing projects or modifications to historic properties listed or eligible for listing in the National Register of Historic Places need to integrate the protection goals with historic interests. Flood proofing measures, whether they be permanent, contingent, or emergency, should not adversely effect the integrity of significant aesthetic and architectural features that are important in defining the overall historical character of the resource. Every reasonable effort should be made to minimize alteration to the structure, property and environment. Preferred structural alterations include retention or duplication of original materials, retention of original style and replacement of historically important structural members only when necessary. Property and environment alterations that minimize disturbance to the landscaping, reduce the possibility of destroying unknown archaeological resources and retain vegetation, walkways, benches, signs, etc. are also preferred. If there is a need to disturb the soil around the structure, the owner should consider the possibility that there may be a need for archaeological exploration. The Historic Preservation Commission can assist in determining the archaeological potential of a particular locale. Archaeological explorations are expensive, and should not be undertaken unless it is determined that significant information is likely to be obtained. The high cost of professional archaeological excavations may make some flood proofing alternatives unattractive. A preliminary assessment of effects to historic properties from flood proofing techniques are presented in Table 2.

All structures selected for further study are located within the historic district. These structures are not listed on the National Register of Historic Places. A preliminary determination of those structures which are considered to contribute to the historical significance of the district has not been made by the State Historic Preservation Commission or by the Secretary of the Interior.

TABLE 2

PRELIMINARY ASSESSMENT OF EFFECTS TO HISTORIC PROPERTIES FROM FLOOD PROOFING TECHNIQUES

PERMANENT MEASURES

Permanent Closures and Seals

Alters characters of windows, doors and other openings. Generally not recommended. If no other options are available, then careful selection of materials and design are necessary to minimize impacts.

Watertight Cores

Alters character of interior features and style. Designs should consider using least amount of interior space for the core.

Flood Walls and Levees

Alters property and environs. Landscaping and external features impacted. Archaeological resources vulnerable. Archaeological survey may be required for mitigation. Intensity of impact would vary.

Elevating Structures

Visual impacts to the ceiling and grade levels. Mitigation may be costly or unachievable.

CONTINGENT MEASURES

Temporary Flood Shields

Permanent impacts to building include anchor bolt, rail guide, and other structural embedments to support portable shields. Portability of shields allows concealed storage. Generally recommended over permanent closures.

Watertight Doors

Appearance may be mitigated with similar material composition of structure. Permanent impacts to building include structural embedments and framing.

Impermeable Fabrics

Visual impact from metal storage containers normally located at or just below grade at building facade.

EMERGENCY MEASURES

Sandbag Dikes

No effect anticipated. Sandbags are portable and may be stored on or off site.

Earthfill Crib retaining Walls and Stop Logs

Some visual and landscaping impacts accompany this measure of protection. Storage of logs and timber supports need to consider visual impacts.

EVALUATION

All alternative designs proposed in this report are based on protecting the structure one foot above the BFE of 32 feet NGVD. The freeboard allowance of one foot is a requirement within the Floodplain Management Ordinance. Freeboard refers to additional design protection above the BFE to account for surface water action induced by waves, changing velocities, floating debris and other water surface disturbances.

Three components of a structure may be vulnerable to flood damage. These components are basements, utilities and mechanical equipment, and floors above grade. Distinct flood proofing options may be developed and evaluated for each component. Evaluation of the options for each component provides a menu with which to develop preliminary decisions towards the most viable flood proofing alternative.

Costs

Construction costs for each flood proofing alternative are preliminary and may not accurately reflect full expense to implement flood proofing measures. The costs are based on field survey information obtained by visual inspection of the interior and exterior of the structure. Construction costs of each alternative have been evaluated to reflect mid-1989 values. Two principal sources have been used to determine costs, FEMA publications and the Building Construction Cost Data Catalog for 1989, 47th edition, by R. S. Means. Costs from FEMA publications were updated using the appropriate ENR cost indices; Costs from the Means' catalog include a city cost index for Lewiston, Maine. Construction cost estimates include overhead and profit. Cost estimates do not include engineering and design, salvage, and disposal costs.

Odd Fellows Hall-Alternative "A"

This alternative consists of dry proofing the exterior basement walls and first floor using a combination of permanent and contingent flood proofing measures.

For the basement walls below grade, permanent measures are considered to be the most viable concept. Permanent measures would not require any further activity preceding a flood, eliminate the difficulty of accessing below grade areas and allow more lead time to activate contingent measures above grade. Also, permanent measures below grade would not detract from the external visual appearance of the building. Structural feasibility of flood proofing the exterior walls is predicated on the ability of the floor to withstand uplift forces and of the walls to withstand lateral forces. Based on discussion with the owner, structural performance from the most recent flood and inspection of the basement interior, this approach appears structurally feasible.

To install this type of flood protection, a trench would have to be excavated approximately 7 feet below grade about the perimeter of the building. Additional care would be needed to remove and store the brick sidewalk for eventual replacement. The existing penetrations which consist of two fuel lines, two ventilation lines, a water pipe and a sanitary pipe along with gaps in the foundation walls would be sealed with grout. Structural feasibility could be enhance by installing a drainage system along the external perimeter to reduce lateral and uplift forces. However, it is assumed that drainage provisions other than a sump pump to remove any seepage are not needed.

Application of this measure would provide protection to grade elevation of 30 feet NGVD. The costs associated with this portion of the flood proofing alternative is estimated to be $ 8,000.

Above grade, 3 additional feet of flood proofing is required to meet the BFE and freeboard design level. All walls, window and door openings below this level need flood proofing. Contingent measures have less impact to the exterior architectural appearance than permanent measures.

Specific contingent measures above grade include flood shields for all doorways and windows and an impermeable fabric for all exterior walls above grade. Impermeable connections between permanent measures below grade and contingent measures above grade would be necessary. At the east, north and west facades, plywood shields and fabric protection along with all necessary fixtures are proposed to protect the walls, windows and doorways. Fabric protection includes storage boxes, fabric and all necessary attachments. For the large bay windows and pseudo doorway facing Winthrop Street, aluminum shields with stiffeners are proposed. Stiffeners could be designed to be permanent below grade and removable above grade. The costs associated with above grade protection is estimated to be $ 9,700.

The remaining component of protection are the utilities and mechanical equipment. These changes consist of relocating the electric and telephone switch boxes and extending the fuel filler and ventilation lines above elevation 33 feet and installing a check valve to the sanitary line. The costs for this component is estimated to be $ 1,100.

Therefore, the estimated construction cost for this alternative is $ 18,800.

<u>Odd Fellows Hall-Alternative "B"</u>

This alternative consists of dry proofing the interior of the basement using permanent measures and dry proofing the first floor using contingent flood proofing measures.

The distinction between Alternatives "A" and "B" is the method with which to flood proof the basement. Alternative "A" proposes flood proofing by sealing the exterior walls with grout; Alternative "B" proposes flood proofing by sealing the interior walls and the upper portion of the exterior walls with grout. The assumptions of structural feasibility, zones of application, and sump pump requirements are the same for each alternative, unless otherwise noted.

To install this type of flood protection, the seams between the granite blocks and other openings would be prepared to accept concrete or grout for water tightness within the interior of the basement. Consideration must also be given to the continuance of water tightness between interior protection below grade and the exterior protection above grade. To accomplish water tightness through the transition, exterior sealing of seams, penetrations and other openings is proposed for the first 2 feet below grade along the exterior of the structure. It is assumed that these provisions would be adequate to withstand loading and maintain water tightness without the need to install exterior drainage systems. Application of this measure would provide protection to grade elevation of 30 feet NGVD The costs associated with this portion of the flood proofing alternative is estimated to be $ 6,100.

Above grade, the same contingent measures of flood proofing as indicated in Alternative "A" are proposed. Thus, the costs associated with above grade protection is estimated to be $ 9,700.

Similarly, the remaining component of utility and mechanical equipment protection are assumed to be the same in scope and cost. The costs for this component is estimated to be $ 1,100.

Therefore, the estimated construction cost for this alternative is $ 16,900.

Odd Fellows Hall-Alternative "C"

This alternative consists of decommissioning the basement and raising the first floor to the BFE. Below grade permanent measures are proposed; above grade, a combination of permanent and contingent measures are proposed.

Decommissioning the basement into an open space classification is a permanent measure. The method proposed to decommission the basement is to fill the basement with clean compacted soil to grade and install the necessary openings at grade to allow for the entry and exit of flood waters. This proposal results in the complete loss of the basement area.

NFIP regulations require that the entry and exit of flood waters be either certified by a registered professional engineer or architect or meet or exceed minimum criteria. The minimum criteria consists of providing two openings of not less than one square inch for every square foot of enclosed area. The costs associated with this proposal is estimated to be $ 8,300.

Above grade, modifications to the first 3 feet of structure would be necessary at the windows and doorways. Along the south facade where the bay windows are located, a 3 foot high masonry wall is proposed to replace the existing wood framing below the bay windows. The bay windows would be reinstalled to fit above the masonry wall. Interior and exterior removable flood shields are proposed for all other window openings and doorways below the BFE. Notions of permanently filling or relocating the window openings do not appear as a viable alternative on the basis of visual appearance and public acceptance. The design of flood shields would be similar to those indicated in Alternative "A". Elevation of the first floor is proposed. Several approaches may be feasible to accomplish this portion of flood proofing. These approaches include elevating the existing floor system, building a false floor and reconstructing the floor to the higher level. For purposes of estimating, reconstruction of the first floor is proposed. In addition, access to the floor from the doorways would be required. The costs associated with flood proofing above grade is estimated to be $ 12,400.

The remaining component of protection are the utilities and mechanical equipment. Electric and telephone switch boxes would need to be elevated above the BFE, and a check valve would need to be installed in the sanitary line. The flooding and drainage equipment along with on-site power supply would be located to the first floor and the existing heating system would be replaced and relocated to the first floor. The costs for this component is estimated to be $ 5,000.

Therefore, the estimated construction costs for this alternative is $ 25,700.

Discussion of Alternatives

Generally, the alternative designs attempt to maintain visual compatibility within the District by minimizing changes to the exterior of the building. During a flood event the flood proofing components would have a noticeable effect to the first three feet of the exterior of this building. Aluminum and plywood shields at windows and doorways and an impermeable fabric encompassing three sides of the building would be the most noticeable components. Following a flood event, a significant portion of the visual impact would be reduced since flood proofing components would be removed leaving only the necessary anchoring attachments on the building facade. All alternatives appear to have comparable visual impact.

Cost estimates reveal that the least cost to flood proof the building would be in excess of $ 17,000. The bulk of the costs would be equally shared between flood proofing the basement and first floor. A small portion of the costs would be to protect the utilities and mechanical equipment and consist mostly of installing a check valve to the sanitary line. From a cost viewpoint, the protection schemes described in Alternates "A" and "B" appear to be more desirable than Alternative "C" since the basement area is retained and utility and mechanical equipment costs are minimized.

All alternatives appear to be structurally feasible based on a preliminary determination. Above grade, the alternatives advocate using 3 feet of the existing walls to accommodate anticipated hydrostatic loads. Below grade, flood protection of the basement also appears feasible and is based on the mass of the building and the condition of the masonry/stone foundation. Below grade protection as described in Alternative "A" would be preferred since additional protection from leakage would be afforded by sealing the exterior of the foundation building.

Kirsten Scarcelli Building-Alternative "A"

This alternative consists of decommissioning the basement and elevating the building above the BFE.

Decommissioning the basement into an open space classification is a permanent measure. The method proposed to decommission the basement is to fill the basement with clean compacted soil to grade and install the necessary openings at grade to allow for the entry and exit of flood waters. This proposal results in the complete loss of the basement area.

NFIP regulations require that the entry and exit of flood waters be either certified by a registered professional engineer or architect or meet or exceed minimum criteria. The minimum criteria consists of providing two openings of not less than one square inch for every square foot of enclosed area. The costs associated with this proposal is estimated to be \$ 9,200.

Above grade, this alternative proposes to elevate the wood framed building 4 feet. The new proposed elevation is based on raising the base of the first floor joists from elevation 28 feet NGVD to elevation 32 feet NGVD and accounts for protecting subfloor insulation. The building would be elevated using steel beams and hydraulic jacks and placed on timber cribbing while the basement foundation is raised. Raising the foundation consists of placing concrete blocks atop the existing foundation walls. After the foundation work is completed, the structure would be lowered onto its new raised foundation. The costs associated with this portion of flood proofing is estimated to be \$ 27,600.

The remaining component of protection involves the disconnecting, relocating and reconnecting utilities and mechanical equipment. These changes would involve relocation of the telephone switch box, disconnection and reconnection of the electric box and water and sanitary line and installation of a check valve in the sanitary line. The costs for this component is estimated to be \$ 1,100.

Therefore, the estimated construction cost for this alternative is \$ 37,000.

Kirsten Scarcelli Building-Alternative "B"

This alternative consists of flood proofing the basement and elevating the building.

The distinction between Alternatives "A" and "B" is retention as opposed to decommissioning the basement. To retain the basement as proposed in this alternative, an impervious floor capable of withstanding uplift forces and impervious basement walls are required. In addition, a sump pump is necessary to account for slight amounts of seepage. To construct the basement floor, cast-in-place concrete with reinforcing is proposed. Attachment of the floor to the existing foundation is to be accomplished with reinforced anchoring. Upgrading the walls to prevent leakage is to be done with cast-in-place concrete. It is assumed that the walls can be upgraded without the need to excavate along the exterior of the walls. This assumption is based on the existing design of the foundation along the west wall where cast-in-place concrete has been constructed to prevent leakage from a sewer drain located adjacent to the exterior of the foundation. The existing windows in the foundation are to be permanently sealed and the bulkhead is to be raised using concrete blocks. The costs associated with this portion of the flood proofing alternative is estimated to be $ 14,800.

Above grade, the same permanent measures of flood proofing the wood framed structure by elevation as indicated in Alternative "A" are proposed. This portion of flood protection has been estimated to cost $ 27,600.

The utility and mechanical equipment protection are assumed to be the same in scope and cost as those of Alternative "A". The costs for this component is estimated to be $ 1,100.

Therefore, the estimated construction cost for this alternative is $ 43,500.

Kirsten Scarcelli Building-Alternative "C"

This alternative consists of constructing a flood wall along the perimeter of the building. The goals of this alternative are to eliminate changes to the wood framing and foundation of the building, minimize contingent requirements and retain all available space within the building as well as meet NFIP requirements.

A flood wall is a permanent measure designed to have flood shields at openings used for access preceding a flood. It is proposed to construct the flood wall with masonry having an average height of 5 feet. Masonry flood walls are more costly than earthen flood walls but require less space. Flood walls require an interior drainage system. The construction method consists of excavating a trench along the perimeter of the building and erecting the wall to provide adequate prevention of infiltration as well as to provide sufficient resistance to lateral forces. Three access openings are proposed for the south, east and north sides of the building. The openings include anchor bolt provisions for installation of flood shields. Construction of the wall along the west side of the building requires modification to a storm drain.

The costs associated with constructing a flood wall of this design is estimated to be $ 42,700.

Modifications to utilities and mechanical equipment include relocation the telephone box and installing a check valve to the sanitary line. The cost to perform these modifications is estimated to be $ 1,000.

Therefore, the estimated construction cost for this alternative is $ 43,700.

Discussion of Alternatives

Generally, the alternative designs proposed for this building would have a permanent noticeable impact. Proposals to raise structures may affect the proportions of the building in relation to other contributing structures within the district. In addition, the new height of the building may be in violation of the maximum building height allowed in the zoning ordinance. All proposals would change the visual appearance of the building at grade levels from raised foundations and exterior walls. However, Alternative "C" may be the favored method since this measure would not alter the appearance at ceiling levels. Although all alternatives could be unacceptable for this particular building, the concepts are offered to be representative of flood proofing wood-framed non-residential buildings.

Cost estimates reveal that elevating a building would be less expensive than constructing a permanent flood wall. The cost to elevate the structure and secure the basement would be in excess of $ 37,000. Whereas, the cost to construct a flood wall is in excess of $ 43,000. The bulk of the costs are associated with elevation and decommissioning the basement. A small portion of the costs would be to protect the utilities and mechanical and consist mostly of installing a check valve to the sanitary line. From a cost viewpoint, the protection schemes involving elevation appear to be less expensive than constructing a flood wall, however, site-specific factors and the near-comparable costs of flood walls cannot rule out consideration for this method of protection.

Based on a preliminary determination, all alternatives are structurally feasible. Elevation is a common practice to flood proof buildings. Flood wall designs of less than 10 feet may not require complex designs. Higher flood walls, although feasible, would necessitate more design and installation requirements.

Garage-Alternative "A"

This alternative consists of redesigning the bay area into an open space classification and enclosing the existing office space and lavatory with a water tight core. This proposal may be favorable to retain the structure as a gas station and service center.

In redesigning the garage bay area into an open space classification, a passive flooding and drainage system is proposed to automatically equalize hydrostatic forces on the exterior walls. Specific criteria to accomplish this design are provided in the NFIP regulations. It is proposed to keep most of the existing interior block wall located between the garage bay and office and lavatory rooms and reconvert the office and lavatory space into a water tight core. A second access is provided to the core by installing stairs and a door above the BFE. Provisions of a sump pump within the core are also be included. To complete redesign, it is proposed to relocate the existing windows in the bay area above the BFE and fill existing windows and doorways and install a water tight door to office area. The costs associated with this portion of the alternative are estimated to be $ 7,800.

Utilities and mechanical equipment would need to be relocated within the core or elevated above the BFE. This includes installing check valves to the sanitary lines and elevating electric and telephone switch boxes. The costs associated with this portion of flood protection is estimated to be $ 1,000.

Therefore, the estimated construction costs for this alternative is $ 8,800.

Garage-Alternative "B"

This alternative consists of redesigning the garage bay area and existing office and lavatory into an open space classification and reconstructing a first floor office above the BFE.

It is proposed to redesign the level below the BFE into an open space classification. The interior walls including those partitioning the existing lavatory are to be removed. Windows in the bay area would be elevated above the BFE and doorways and windows in the office and lavatory would be permanently filled. A passive flooding and drainage system is proposed for the lower level to automatically equalize hydrostatic forces on the exterior walls. Specific criteria to accomplish this design are provided in the NFIP regulations. The costs associated with this portion of the alternative are estimated to be $ 3,000.

The first floor is to be supported by columns. This alternative would not restrict use of the bay area including the hydraulic lift. Design of the first floor is to include internal and an external access and two windows. The costs associated with this portion of flood protection is estimated to be $4,900.

Utilities and mechanical equipment would need to be relocated within the core or elevated above the BFE. This includes installing check valves to the sanitary lines and elevating electric and telephone switch boxes. The costs associated with this portion of flood protection is estimated to be $ 1,000.

Therefore, estimated construction costs for this alternative is $ 8,900.

Garage-Alternative "C"

This alternative consists of redesigning the lower level into an open space classification and constructing a first floor above the BFE. The proposed redesign may be suitable for reconverting the building use into a professional building with parking accommodations in the lower level.

It is proposed to redesign the lower level into an open space classification. All interior walls including those partitioning the existing lavatory are to be removed. All windows and doorways at the north west and south exterior wall are to be permanently filled. A second garage bay opening is proposed to be constructed at the east side of the structure. A passive flooding and drainage system is proposed for the lower level to automatically equalize hydrostatic forces on the exterior walls. Specific criteria to accomplish this design are provided in the NFIP regulations. In effect, the redesign produces a two story structure with parking available in the lower level and office space in the upper level. The costs associated with this portion of the alternative are estimated to be $ 3,400.

In constructing the first floor to be above the BFE, the it is proposed to support the floor with columns and the interior block wall. Design of the first floor is to include internal and an external access and windows for each wall. The costs associated with this portion of flood protection is estimated to be $ 6,600.

Utilities and mechanical equipment would need to be relocated to the first floor. This includes relocation of the lavatory, heating equipment and electric and telephone switch boxes. The costs associated with this portion of flood protection is estimated to be $ 4,900.

Therefore, the estimated construction costs for this alternative is $ 14,900.

Discussion of Alternatives

Generally, the alternative designs attempt to flood proof this building by maintaining the external dimensions of the building. The alternatives give consideration to maintaining the facility as a vehicle service center and to converting the building into other uses. All alternatives appear to have comparable visual impact.

Cost estimates reveal that the least cost to flood proof the building would be in excess of $ 9,000. The cost comparison between alternatives "A" and "B" demonstrate that providing a water tight core is similar to elevating the floor. The costs of Alternative "C" are less comparable since this alternative considers other usage of the building. In the absence of a complete economic analysis, Alternatives "A" and "B" are the most attractive from a least cost viewpoint.

All alternatives appear to be structurally feasible based on a preliminary determination. The designs proposed in Alternatives "B" and "C" are preferred on the basis that the exterior walls would not be required to resist hydrostatic forces.

New Construction

New construction as defined in NFIP regulations refers to structures for which construction was initiated on or after the date of a floodplain management regulation adopted by a community. For purposes of this report, "new construction" refers to proposed structures in a floodplain where flood proofing measures are incorporated as an integral part of the initial structural design.

New construction is permitted within the flood-prone area of the Historic District subject to meeting the requirements of the Local Ordinances as well as other appropriate regulations. In general, new construction must be compatible with the historic and architectural character of the district as indicated in the Historical Preservation Ordinance and meet the dry flood proofing requirements of the Floodplain Management Ordinance.

For new construction to meet the criteria within the Historical Preservation Ordinance, discussions with the City and State officials is encouraged to determine viability of building design features. Architectural consideration should encompass the compatibility of scale, building materials and texture towards new construction. Property and environment considerations should maintain landscaping and other compatible aesthetic interests.

For new construction to meet the criteria of the Floodplain Management Ordinace, similar discussions are encouraged. All plans for new construction in the floodplain need to incorporate dry flood proofing requirements and not seek variance from these requirements. In addition to the flood proofing techniques described elsewhere in this report, other techniques including water proofing, elevating on fill and water proofing may be viable.

Water Proofing

The term water proofing as applied to new construction refers to the design of impermeable structural components that prevent flood waters from reaching the interior. This approach requires sufficient design of exterior surfaces to withstand lateral and uplift hydrostatic forces. Walls made of reinforced concrete or masonry are necessary for water depths in excess of 6 feet; floors made of reinforced cast-in-place concrete are generally the only feasible material to withstand large uplift forces. Floors should be anchored into the walls in a manner to allow the total weight of the structure to counteract uplift forces.

Elevating on Fill

Elevating on fill refers to locating a structure atop land fill placed within a floodplain. This approach requires land area of sufficient size to accommodate side slopes and access to the structure. Placing land fill requires compaction so as not to allow uneven settlement during structural life and requires protection from natural erosion processes. NFIP regulations include specific design criteria concerning fill in a floodplain so as to avoid significant increases in depth and velocity of flood waters. Traditional construction practices can thereafter be applied to the structure.

Elevating on Stilts

Elevating on stilts refers to carrying functional floors of a structure above grade using support columns (i.e. posts, piles, piers or walls). This approach requires that the support columns are capable of withstanding loads from moving water as well as meeting other design load conditions. Columns may be constructed with a variety of materials but concrete and masonry materials are preferred due to strength and durability. Levels below the functional floors can be used for purposes commensurate with open space definition.

SECTION VI - CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

This report documents the results of an investigation to support comprehensive floodplain management planning for the City of Hallowell, Maine. The City of Hallowell, which has a historic district listed on the National Register of Historic Places, is a participant of the National Flood Insurance Program. Approximately 70 buildings are subject to a 100-year flood event. Most of these buildings are located within the business and historic districts.

An investigation of alternative flood proofing designs have been made for three different buildings. Designs were based on meeting the dry proofing criteria of the National Flood Insurance Program and guidelines included in the Secretary of Interior's Standards for Historic Preservation Projects. Evaluation of the alternative designs reveal that construction costs and visual impacts vary depending upon the type of building and method of protection. Flood proofing costs for non-residential masonry buildings subject to water levels less than six feet vary from \$ 9,000 to \$ 17,000. Flood proofing designs for this type of building appear to be capable of minimizing visual changes to the building. Construction costs for elevating multiple-storied wood framed buildings are estimated to be \$ 37,000. Elevation techniques may significantly alter the visual appearance and not conform to the City's Historic and Zoning Ordinances. The use of flood walls or other flood proofing techniques, although more costly, may be a preferred alternative.

Several of the buildings subject to flood damage may qualify for a variance to the requirements of dry flood proofing as contained in the National Flood Insurance Program. Variances allow participation in the National Flood Insurance Program but insurance premium rates are determined by statute according to existing risk and are not modified by the granting of variances. The granting of variances, however, still must conform to patterns consistent with the objectives of sound flood plain management as contained in the NFIP. Buildings that contribute to the historical significance of the historic district would be eligible for the National Register and would therefore be eligible for variances status by the Federal Emergency Management Agency. A preliminary determination of such buildings would need to be made by the State Historic Preservation Commission or by the Secretary of the Interior. Buildings that qualify for a variance may be allowed to implement alternative methods such as wet or emergency flood proofing measures in interests of preserving the historical significance of the district. Upon request, the State Historic Preservation Office would provide the City with a list of the contributing and noncontributing structures and elements within the historic district.

RECOMMENDATIONS

1. A Registered Professional Engineer or Architect should be consulted before undertaking studies and designs for flood proofing buildings located within the flood prone area of the Historic District in Hallowell, Maine. NFIP regualtions require that the design and methods of construction are in accordance with accepted standards of practice and certified by a Registered Professional Engineer or Architect.

2. Local, State and Federal Agencies should be appraised of flood proofing efforts to identify sources of technical assistance and to develop an understanding of floodplain and other regulations that are applicable to the proposed action.

3. A preliminary determination of structures and features that contribute to the significance of the historical District should be made by the State Historic Preservation Commission or by the Secretary of the Interior.

4. The City of Hallowell should adopt the allowance for variances from meeting dry flood proofing criteria consistent with FEMA interpretation.

5. The City should coordinate all flood proofing activities with the State Historic Preservation Commission. The Commission can assist the City with establishing preservation priorities to minimize or avoid individual and cumulative effects to the significant features of the historic District.

APPENDIX A

GENERAL STANDARDS AND DEFINITIONS FOR HISTORIC PRESERVATION PROJECTS

GENERAL STANDARDS

1. Every reasonable effort shall be made to provide a compatible use for a property that requires minimal alteration of the building, structure, or site and its environment, or to use a property for its originally intended purpose.

2. The distinguishing original qualities or character of a building, structure, or site and its environment shall not be destroyed. The removal or alteration to any historic material or distinctive architectural features should be avoided when possible.

3. All buildings, structures, and sites shall be recognized as products of their own time. Alterations which have no historical basis and which seek to create an earlier appearance shall be discouraged.

4. Changes, which may have taken place in the course of time, are evidence of the history and development of a building, structure, or site and its environment. These changes may have acquired significance in their own right, and this significance shall be recognized and respected.

5. Distinctive stylistic features or examples of skilled craftsmanship, which characterize a building, structure, or site, shall be treated with sensitivity.

6. Deteriorated architectural features shall be repaired rather than replaced, wherever possible. In the event replacement is necessary, the new material should match the material being replaced in composition, design, color, texture, and other visual qualities. Repair or replacement of missing architectural features should be based on accurate duplications of features, substantiated by historical, physical, or pictorial evidence rather than on conjectural designs or the availability of different architectural elements from other buildings or structures.

7. The surface cleaning of structures shall be undertaken with the gentlest means possible. Sandblasting and other cleaning methods that will damage the historic building materials shall not be undertaken.

8. Every reasonable effort shall be made to protect and preserve archaeological resources affected by, or adjacent to any acquisitions, protection, stabilization, preservation, rehabilitation, restoration, or reconstruction project.

STABILIZATION

9. Stabilization shall reestablish the structural stability of a property through the reinforcement of loadbearing members or by arresting material deterioration leading to structural failure. Stabilization shall also reestablish weather resistant conditions for a property.

10. Stabilization shall be accomplished in such a manner that it detracts as little as possible from the property's appearance. When reinforcement is required to reestablish structural stability, such work shall be concealed wherever possible so as not to intrude upon or detract from the aesthetic and historical quality of the property, except where concealment would result in the alteration or destruction of historically significant material or spaces.

REHABILITATIONS

11. Contemporary design for alterations and additions to existing properties shall not be discouraged when such alterations and additions do not destroy significant historic, architectural, or cultural material and such design is compatible with the size, scale, color, material, and character of the property, neighborhood, or environment.

12. Whenever possible, new additions or alterations to structures shall be done in such a manner that if such additions or alterations were to be removed in the future, the essential form and integrity of the structure would be unimpaired.

RESTORATION

13. Reinforcement required for structural stability or the installation of protective or code required mechanical systems shall be concealed whenever possible so as not to intrude or detract from the property's aesthetic and historical qualities, except where concealment would result in the alteration or destruction of historically significant materials or spaces.

14. When archaeological resources must be disturbed by restoration work, recovery of archaeological material shall be undertaken in conformance with current professional practices.

GENERAL DEFINITIONS

<u>Protection</u> — Is defined as the act or process of applying measures designed to affect the physical condition of a property by defending or guarding it from deterioration, loss or attack, or to cover or shield the property from danger or injury. In the case of buildings and structures, such treatment is generally of at temporary nature and anticipates future historic preservation treatment; in the case of archaeological sites, the protective measure may be temporary or permanent.

<u>Stabilization</u> — Is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

<u>Preservation</u> — Is defined as the act or process of applying measures to sustain the existing form, integrity, and material of a building or structure, and the existing form and vegetative cover of a site. It may include initial stabilization work, where necessary as well as ongoing maintenance of the historic building materials.

<u>Rehabilitation</u> — Is defined as the act or process of returning a property to a state of utility through repair or alteration which makes possible an efficient contemporary use while preserving those portion or features of the property which are significant to its historical, architectural, and cultural values.

<u>Restoration</u> — Is defined as the act or process of accurately recovering the form and details of a property and its setting as it appeared at the particular period of time by means of the removal of later work or by the replacement of missing earlier work.

<u>Reconstruction</u> — Is defined as the act or process of reproducing by new construction the exact form and detail of a vanished building, structure, or object, or a part thereof, as it appeared at a specific period of time.

(Excerpts from <u>Standards for Historic Preservation Projects</u> by the Secretary of the Interior.)

APPENDIX B

FEDERAL HISTORIC PRESERVATION AGENCIES

FEDERAL HISTORIC PRESERVATION AGENCIES

MAINE HISTORIC PRESERVATION COMMISSION

55 Capitol Street
Augusta, Maine 04333

(207) 289-2133

Earle G. Shettleworth, Director
Betsy Igleheart - Historic Preservation Staff
Kirk Money - Historic Preservation Staff

ADVISORY COUNCIL ON HISTORIC PRESERVATION

Old Post Office Building
Suite 803
1100 Pennsylvania Avenue
Washington, D.C. 20004

(202) 786-0505

Don Klima - Eastern Office of Project Review

NATIONAL PARK SERVICE

Mid-Atlantic Region
Cultural Resource Management
U.S. Customs House, Room 251
2nd and Chestnut Streets
Philadelphia, PA 19106

(215) 597-6484
(215) 597-2334

Lloyd Chapman
Tina Van Dyke - Historic American Buildings Survey

HISTORIC PRESERVATION REGULATIONS/PUBLICATIONS

U.S. Department of the Interior

1983 The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. National Park Service, Preservation Assistance Division, Washington, D.C., U.S. Govt Printing Office.

1983a Archaeology and Historic Preservation; Secretary of the Interior's Standards and Guidelines. Federal Register, Vol 48, No. 190, September 29, 1983, pg 44716

Advisory Council on Historic Preservation

1986 Protection of Historic Properties 36 CFR Part 800

APPENDIX C

BIBLIOGRAPHY

Federal Emergency Management Agency. NATIONAL FLOOD INSURANCE PROGRAM AND RELATED REGULATIONS. Washington, D.C., U.S. Government Printing Office, Revised as of October 1, 1988.

Federal Emergency Management Agency. FLOOD PROOFING NON-RESIDENTIAL STRUCTURES. Washington, D.C., U.S. Government Printing Office, May 1986.

Federal Emergency Management Agency. FLOOD EMERGENCY AND RESIDENTIAL REPAIR HANDBOOK. Washington, D.C., U.S. Government Printing Office, March, 1986.

Federal Emergency Management Agency. RETROFITTING FLOOD-PRONE RESIDENTIAL STRUCTURES. Washington, D.C., U.S. Government Printing Office, September, 1986.

Federal Emergency Management Agency. ELEVATED RESIDENTIAL STRUCTURES. Washington, D.C., U.S. Government Printing Office, March, 1984.

Federal Emergency Management Agency. REDUCING LOSSES IN HIGH RISK FLOOD HAZARD AREAS. Washington, D.C., U.S. Government Printing Office, February, 1987.

U.S. Army Corps of Engineers, Office of Chief of Engineers. FLOOD PROOFING SYSTEMS & TECHNIQUES. Washington D.C., U.S. Government Printing Office, December, 1984.

U.S. Army Corps of Engineers, Office of Chief of Engineers. FLOOD PROOFING REGULATIONS. Washington D.C., U.S. Government Printing Office, June 1972.

U.S. Army Corps of Engineers, Vicksburg District. FLOOD PROOFING TESTS. August, 1988.

U.S. Army Corps of Engineers, New England Division. KENNEBEC RIVER BASIN, WATER RESOURCES STUDY. March, 1989.

U.S. Army Corps of Engineers, Baltimore District. COST REPORT ON NON-STRUCTURAL FLOOD DAMAGE REDUCTION MEASURES FOR RESIDENTIAL BUILDINGS WITHIN THE BALTIMORE DISTRICT. Fort Belvoir, VA. U.S. Institute for Water Resources, 1977.

U.S. Department of the Interior. STANDARDS FOR HISTORIC PRESERVATION PROJECTS, Washington, D.C., U.S. Government Printing Office, 1979.

Flood Loss Reduction Associates. FLOODPLAIN MANAGEMENT HANDBOOK. Washington, D.C., U.S. Government Printing Office, 1981.

City of Hallowell, Maine. FLOODPLAIN MANAGEMENT ORDINANCE.

City of Hallowell, Maine. ZONING ORDINANCE.

City of Hallowell, Maine. HISTORIC PRESERVATION ORDINANCE.

R.S. Means Company, Inc. BUILDING CONSTRUCTION COST DATA. 1989, 47th Annual Edition.

APPENDIX D

CORRESPONDENCE

MAINE HISTORIC PRESERVATION COMMISSION
55 Capitol Street
State House Station 65
Augusta, Maine 04333

Earle G. Shettleworth, Jr.
Director

Telephone:
207-289-2133

April 10, 1990

Mr. Joseph I. Ignazio, Chief
Planning Division
Department of the Navy
New England Division
Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02254-9149

Dear Mr. Ignazio:

Thank you for submitting the draft floodproofing study for the City of Hallowell. The Hallowell National Register Historic District encompasses an area of about 200 acres and includes commercial, retail and (former) industrial buildings. The commercial area along Water Street is the portion of the district that is most effected by flooding. This effects areas consisting of 30 masonry buildings and 10 wood frame structures.

I have reviewed the three case studies and would like to make the following comments.

Odd Fellows Hall

Of the alternatives proposed, I concur with you that Alternative A. appears to have the least effect on the historic resources. The possibility of potential archaeological sites must be considered with the trenching. The impact of hardware and fastenings required by the flood shields would have to be considered.

I would have reservations about the waterproofing methods proposed in Alternative B. and the changes to the interior proposed in Alternative C.

Kirsten Scarcelli Building

Again I concur with the report that all of the alternatives proposed for the Scarcelli Building would have an adverse effect on the resource. Elevating the building, proposed in Alternative A & B. would alter the proportions of the building and its relationship with the neighboring historic buildings. It is very unlikely that elevating a structure would even be acceptable. Alternative C. would have an adverse impact on the site from both an archaeological as well as historical viewpoint.

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Garage

All of the proposed alternatives for the garage would most likely have an adverse effect. Alternative A. may be marginally acceptable if the garage's interior does not retain its historic integrity. It would appear that utility cells and temporary floodproofing closures for windows and doors wouldhave the least impact on the historic resources. It is very unlikely that elevating structures would ever be an acceptable treatment.

New Construction

Although each new construction project would require individual review, it appears that of the three techniques proposed, waterproofing (described on page 21) would most easily enable a new design to be compatible with its historic neighbors.

I would like to state I concur with your recommendations (page 23) and offer our support in order to accomplish the goal of floodproofing these buildings and maintaining the historic character of the Hallowell Historic District.

If you would like to discuss our comments or if I can be of further assistance please do not hesitate to call.

Sincerely,

Earle G. Shettleworth, Jr.
State Historic Preservation Officer

EGS/slm